

**FISCAL YEARS 2000, 2001 and 2002
MONITORING AND EVALUATION REPORT**



LAND and RESOURCE MANAGEMENT PLAN

August 2004

MONITORING & EVALUATION REPORT

Land and Resource Management Plan Chippewa National Forest Fiscal Years 2000, 2001, 2002

APPROVAL AND DECLARATION OF INTENT

I have reviewed the FY 2000, 2001, and 2002 Monitoring and Evaluation Report for the Chippewa National Forest that was prepared by an interdisciplinary team during the summer 2003. The Monitoring and Evaluation Report meets the intent of both the Forest Plan (Chapter V) as well as the regulations contained in 36 CFR 219.

This report is approved:

NORMAN L. WAGONER
Forest Supervisor

Date

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EXECUTIVE SUMMARY

FISCAL YEARS 2000, 2001 AND 2002 MONITORING & EVALUATION REPORT

Chippewa National Forest

We have been monitoring and evaluating Land and Resource Management Plan (Forest Plan) implementation since its approval in 1986. Our Monitoring and Evaluation plan is described in chapter V of the Forest Plan. We've monitored actual outputs against predicted outputs, how well we implemented standards and guidelines, how well those standards and guidelines protect forest resources, and whether or not our actions are moving the Forest toward the long-term desired future conditions described in chapter IV of the Forest Plan. Monitoring plays a crucial role in surfacing irregularities or areas that may require change.

Forest Plan Revision

The Chippewa and Superior National Forests are working together to revise their Forest Plans. A separate Forest Plan is being prepared for each National Forest. The current Chippewa National Forest Plan was implemented in 1986. Since that time, there have been considerable changes in conditions on the Forest, shifts in public demands, technological advances, and a better understanding of forest ecosystems. These changes are reflected in the issues and addressed by this revision. One of the most notable changes is the role of landscape ecosystems as a key component in the analysis of the alternatives in the Draft Environmental Impact Statement (EIS) and the definitions of desired conditions in the Proposed Forest Plan.

The Draft EIS and Forest Plan were released for comment in May 2003. Alternative E was identified as the preferred alternative. Alternative E emphasizes a mix of young and old forest settings; increases the amount of uneven-aged management; emphasizes a mix of developed and undeveloped recreation with motorized and non-motorized opportunities; and emphasizes community's social and economic stability. Written comments were accepted until September 11, 2003. Based on the responses received during the comment period and other information, the planning team will revise the Draft EIS and Plan to produce a Final EIS and Plan. Selection of an alternative to implement as the revised Forest Plan will be based on the analysis in the Final EIS. A full description of and the rationale for the selected alternative will be presented in a Record of Decision expected in 2004. The revised Forest Plans will guide management of the Chippewa and Superior National Forests for the 10 to 15 year period following approval.

Key Events since 2000

Regional Forester Sensitive Species

The Regional Forester approved an updated Sensitive Species list for the Eastern Region on February 29, 2000. For the Chippewa, there are 46 species on the list. The Chippewa National Forest developed a strategy to evaluate the effects of projects for which the planning was completed on the sensitive

species and modified them where necessary. Since then, screening and surveys are completed for Threatened, Endangered, and Sensitive species (TES) to provide the necessary information for environmental analysis.

Canada Lynx

Canada Lynx (*Lynx Canadensis*) was listed as a threatened species by the US Fish and Wildlife Service in the March 24, 2000 Federal Register. Lynx populations in the Great Lakes Geographic Area are covered under the “Canada Lynx Conservation Agreement” between US Forest Service and US Fish and Wildlife Service. The Chippewa National Forest is in the transition zone between the boreal forests north of and the hardwood forests south of it. Consequently, habitat conditions for lynx are more marginal here than in other areas within its range. Areas on the forest with habitat for lynx were identified as lynx analysis units and are considered in project planning. Upon completion of the analysis, any project that may affect lynx requires consultation with the Fish and Wildlife Service. No verified lynx occurrence has been recorded within the Chippewa National Forest boundary since 1984.

Road Analysis Process

In January 2002 the Forest Service implemented a roads analysis process (RAP). The roads analysis follows a process outlined in the document *Roads analysis: Informing Decisions About Managing the National Forest Transportation System* (USFS, 1999a). The review provides decision makers with information necessary to develop road systems that are safe, are responsive to public needs and desires, are affordable and efficiently managed, have minimal negative ecological effects, and are in balance with available funding for planned management actions. It is an integrated ecological, social, and economic approach to transportation planning that addresses both existing and potential future roads.

In June 2002 an overview and summary of the RAP was published in a document entitled *Chippewa National Forest Roads Analysis Process*. This document looks at the arterial and collector roads (objective maintenance levels, 3, 4 and 5) on the Forest and makes recommendations for changes. As site-specific projects are analyzed, forest access opportunities are investigated. These road access opportunities can include new road construction and or recommendations for existing roads such as maintenance, decommissioning, closure or reconstruction.

National Visitor Use Monitoring

In 2001 the Recreation Visitation Use Monitoring (NVUM) Program was completed for the CNF. This nationally designed survey process and report collected information about visitor satisfaction and recreational use on the CNF. The NVUM study will be conducted again on the CNF in 2006 and provide statistically accurate recreation use estimates.

Results of the NVUM on the Chippewa National Forest for FY01 were 2.3 million recreation visits for 6.1 million recreation visitor days (RVD, 1 person for 12 hours). The top three recreation activities were snowmobiling, hunting, and fishing. Visitor satisfaction met or exceeded visitor expectations. A further breakdown and activity analysis can be found in the National Visitor Use Monitoring Results (Kocis, et al., May 2002).

Red Pine Retention Study

North Central Research Station is conducting this study in cooperation with the Chippewa National

Forest, and University of Minnesota. The study area is located in the Tamarack Point area of the Chippewa National Forest.

In currently managed, naturally regenerated and planted red pine stands, there is minimal variation in structure and composition relative to historic conditions. The study is designed to create red pine stands that more closely represent past ecosystems. This study uses partial harvests to reduce stands to the same basal areas but leaves remaining overstory trees in different spatial patterns on the landscape. The patterns include large gaps, small gaps, and traditional, evenly spaced thinning. Jack, red and eastern white pine were planted in the understory to increase structure and composition. The varying spatial patterns and densities of the overstory will be compared to the effects on growth and survival of regeneration, understory composition, site productivity, avian communities and disease incidence. Results will be monitored for 5+ years of after treatment.

Logging began in August 2002 and was completed in April 2003. Planting was done in May 2003. The first summer of data collection occurred in 2003.

The Big Lake Management Plan Environmental Assessment covered this study. (1999). The establishment report and study Plan is *Restoring Stand Complexity in Managed Red Pine (Pinus resinosa) Ecosystems Using Overstory Retention and Understory Control*, (Palik, Zasada, and Kern, 2003).

Annual Monitoring

In 2001, four projects across the forest were reviewed that represented a spectrum from recreation, vegetation management and engineering/transportation:

- Third River Road Reconstruction
- Two Rivers Timber Sale
- Big Lake Vegetation Management Project
- Mi-Ge-Zi Bike Trail

Projects were reviewed to determine if treatments or project design incorporated the necessary mitigation measures and design features identified during planning were specified in contracts and occurred on the ground, and if what was implemented matched the environmental documents and decision notices.

In 2002, members of the Forest Leadership Team and other forest employees spent a day reviewing four sites on the Walker District: the Paul Bunyan Connector Trail, Shingobee River Crossing, and harvest units from two previous sales. The Paul Bunyan Connector Trail sites reviewed erosion control measures including seeding, riparian filter strips and silt fences, trail design to avoid wetlands, wetland restoration, and contract administration of the project. Shingobee River Crossing site had significant past erosion problems that were effectively dealt with by installing a larger culvert, by seeding and re-vegetating, and by installing silt fences that resulted in an immediate decrease in sediment and erosion to gullies. Harvest units in northern hardwoods and aspen stand were reviewed to determine if objectives were met, reforestation success was achieved, and costs and efficiencies were considered.

Overall, projects were well implemented and within the scope of the environmental documents. Forest Plan standards and guidelines, best management practices (BMPs) and mitigation measures were applied on the ground. Contract administrators effectively enforced the contract specifications and mitigation measures to achieve the desired outcome.

Our monitoring results and evaluations indicate that we are implementing the Forest Plan adequately and, in some cases, better than adequately. Through timber harvesting, we are close to meeting the Age Class Distribution as planned for year 2000 (p. IV-208). Threatened, Endangered, and Sensitive and Management Indicator Species have not been adversely impacted. Management strategies have resulted in the increase in the wolf and eagle populations in the area. Soil and water quality were not adversely impacted. All of our programs are managed within Forest Plan direction and within the limits of funding received from the United States Congress.

Public Involvement

We continue to publish the *Chippewa National Forest Quarterly*, a schedule of proposed actions and decisions that implement the Forest Plan. We encourage the public to become part of our management process by participating in the Forest Plan Revision effort as well as commenting on project proposals through the NEPA process. Information about planning can be found on the Internet at www.fs.fed.us/r9/chippewa.

**FOREST PLAN REVISION and
MONITORING & EVALUATION REPORT**

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FOREST PLAN REVISION AND MONITORING & EVALUATION REPORT

INTRODUCTION

The Chippewa National Forest Land and Resource Management Plan (Forest Plan) was approved in June 1986, and implementation began that same year. The National Forest Management Act Planning regulations specify that, "at intervals established in the Forest Plan, implementation shall be evaluated on a sample basis to determine how well objectives have been met and how closely management standards and guidelines have been applied. Based on this evaluation, the interdisciplinary team shall recommend to the Forest Supervisor such changes in management direction, revisions, or amendments to the Forest Plan as are deemed necessary." This report documents what topics will be addressed in our Forest Plan Revision effort and evaluates the results of monitoring Forest Plan implementation in fiscal years 2000, 2001 and 2002.

I. FOREST PLAN REVISION

The Chippewa and Superior National Forests are working together to revise their Forest Plans. One Environmental Impact Statement will be prepared and two revised Forest Plans will be developed—one for each National Forest.

Generally, Forest Plans are to be revised every 10-15 years to address changed conditions and new information. The current Chippewa National Forest Plan was implemented in 1986. Since that time, there have been considerable changes in conditions on the Forest, shifts in public demands, technological advances, and a better understanding of forest ecosystems. These changes are reflected in the issues and addressed by this revision. One of the most notable changes is the role of landscape ecosystems as a key component in the analysis of the alternatives in the Draft Environmental Impact Statement (EIS) and the definitions of desired conditions in the Proposed Forest Plan.

During 2000-2002, the Revision Team worked on defining alternatives, management areas descriptions, standards and guidelines, and analyzing the potential environmental, social, and economic effects of the alternatives related to the communities within and around the Forest and the natural resources on the Forest. The two National Forests have worked closely with tribal, state, and county governments throughout the process. Numerous public meetings were held to share information with the public and to obtain their input. Public participation is important in developing revised Forest Plans that are valid, reasonable, able to be implemented, and have public support.

The Draft EIS and Forest Plan were released for public comment in May 2003. The Draft EIS documents the potential environmental effects of seven alternatives designed around resource, social and economic issues as identified through public and employee involvement. Alternative E was identified as the preferred alternative. Alternative E emphasizes a mix of young and old forest settings, increases the amount of uneven-aged management, emphasizes a mix of developed and undeveloped recreation with motorized and non-motorized opportunities, and emphasizes community's social and economic stability. Written comments were accepted until September 11, 2003. Based on the responses received during the comment period, the planning team will revise the Draft EIS and Forest Plan to produce a Final EIS and Forest Plan.

Release of the Final EIS, Forest Plan, and Record of Decision is expected in 2004. A full description of and the rationale for the selected alternative will be presented in the Record of Decision. Selection of this alternative will be based on the analysis in the Final EIS. The Revised Forest Plan will guide management of the Chippewa National Forest for the 10 to 15 year period following approval.

Questions concerning revision can be directed to: Brenda Halter-Glenn, Forest Planner, at (218) 335-8651, bhalter-glenn@fs.fed.us or Kay Getting, Chippewa Public Affairs, (218) 335-8673 or kgetting@fs.fed.us.

II. AMENDMENTS TO THE FOREST PLAN

There have been no amendments approved since 1996. The Chippewa and Superior National Forests decided that initiating or processing minor amendments concurrently with the revision process might confuse our constituents and require us to divert funding and staffing for Forest Plan changes that could be incorporated into the revised Plan.

III. PROGRAM FUNDING

A. Congressional Allocations

Budgets are allocated annually (our fiscal year runs from October 1 through September 30) by the US Congress, in amounts and mixes that reflect Congressional priorities and desires. White House Administration objectives and Forest Service national and regional priorities further influence Forest budgets.

Budget numbers for the last five fiscal years (FY) are expressed in 2002 dollars by using the implicit price deflator. Numbers reflect dollars allocated by Congress and do not include partnership dollars from other organizations.

Table 1: Chippewa Budget allocation by FY

<u><i>FY</i></u>	<u><i>Total Budget (Millions)</i></u>
98	9.721
99	11.495
00	10.429
01	11.658
02	12.528

B. Partnerships, Grants & Agreements

We continue to seek partnerships with other public and private organizations and volunteers to assist us in meeting the Forest goals and in conducting Forest Plan monitoring and evaluation. Partners and volunteers benefit us in two ways; they leverage the funding we receive from Congress and they promote public involvement in National Forest management.

1. 2000

In 2000, the Forest had 50 active partnerships that provided almost \$600,000 in support to our recreation, wildlife habitat, heritage resources, watershed program, fisheries management, and Forest Plan Revision.

Some examples are: summer home permittees on Star Island and Lake Winnie (MDNR also) for shoreline stabilization; the University of Minnesota and National Fish & Wildlife Foundation for Goshawk habitat; University of Minnesota for computer modeling for Forest Plan Revision; Leech Lake Band of Ojibwe (LLBO); Minnesota Department of Natural Resources (MDNR), & Cass County for wildlife habitat improvement through prescribed burning; MDNR, Natural Resources Research Institute (NRRI), Bemidji State University, Blackduck Community Education, and Bigfork Lions for fisheries projects.

2. 2001

In 2001, the Forest had 20 partnerships that provided almost \$300,000 in support to wildlife habitat, recreation, fisheries, heritage resources, and various other natural resource projects.

Several key partnerships were developed. Itasca Community College and the FS partnered to provide opportunities for students to earn a diploma or a two-year natural resources degree with an emphasis in

wildland firefighting. Through an Intergovernmental Personnel Act (IPA), the FS assigned an employee for a Program Leader/Instructor to implement the program and train students in wildland firefighting courses.

The FS partnered with the Minnesota Conservation Corps to provide young adults opportunities for job training, personal development, conservation service, and natural resource appreciation while at the same time accomplishing work that contributes to and benefits the public lands.

We partnered with the MDNR for the reconstruction of the Knutson Dam Boat Access and Breakwater and for the expansion of the Little Cut Foot Sioux Boat Access. Also, we worked with the US Department of Interior Geological Survey for Goshawk inventory. MDNR, the Plughat Summerhome Association, Cass Lake Area Learning Center, Dixon Lake Association, Jesse Lake Association, and the Leech Lake Band of Ojibwe assisted with fisheries projects.

3. 2002

In 2002, the Forest had 30 partnerships that provided around \$500,000 in support of our watershed program, recreation, special uses, and heritage resources.

We worked in conjunction with summer home permittees on the South Winnie Shoreline Stabilization project. The MDNR and Federal Highway Administration were key partners in constructing the next phase of the Mi-Ge-Zi Bike Trail. The Itasca Community College provided student interns for the fire program. MDNR, Cass Lake Area Learning Center, Dixon Lake Association, Leech Lake Band of Ojibwe, National Forest Foundation, and the Jesse Lake Association supported fisheries projects.

IV. MONITORING RESULTS AND EVALUATION

Monitoring and evaluation are separate, sequential activities. Their purpose is to provide information that will help determine whether Forest Service programs are meeting the Forest Plan direction from both the quality and quantity standpoint. This direction includes goals and objectives, management prescriptions, and standards and guidelines. The end result of these activities is a decision regarding the need for change in the Forest Plan.

Monitoring - The purpose of monitoring is to observe and record the results of actions. The information collected through this process is used to determine:

- If Forest Plan goals and objectives are being achieved,
- If management prescriptions are applied as directed by the standards and guidelines,
- If the results of applying the prescriptions address the management problems, issues, concerns and opportunities, and
- If significant effects are occurring as predicted.

There are two criteria that determine monitoring requirements. They are (1) monitoring needs required by federal regulations such as the 1982 Planning Rule (36CFR 219) and the National Forest Management Act (NFMA) and (2) considerations found to be significant and linked to the resolution of public issues, management concerns, resource development opportunities and corresponding environmental effects.

Monitoring consists of the collection of information from selected sources on a sample basis. The frequency, precision, and reliability of the sample are based on the relative importance and associated risk of the parameter being monitored, the natural variation of the parameter, and the technology and resources available. A full spectrum of data collection techniques will be used these techniques include:

- Site-specific observations by specialists,
- Field assistance trips,
- General field observations,
- Management attainment reporting system,
- Formal management reviews on a scheduled basis, and
- Discussions with other agencies and general public users.

Evaluation determines how well actual results are meeting Forest Plan direction and consequently, whether the Plan needs to be changed.

Forest Plan Monitoring Direction --- Direction for the Chippewa National Forest's monitoring and evaluation effort is contained in Chapter IV of the Forest Plan. This specific monitoring plan is included in Chapter V of the Forest Plan.

The following sections display monitoring results and evaluation of outputs and accomplishments, compliance with standards and guidelines, NFMA requirements, measured effects of implementation, management indicator species, and candidate sensitive species. Rationale for proposed changes to the Forest Plan and research needs may also be discussed within this section.

A. VEGETATION COMPOSITION

1. Composition and Age Class

Vegetative composition can be depicted as age classes by forest timber type groups as shown in the 1986 Forest Plan on page IV-208. In Table 2 below, Forest Plan planned age class distribution for the year 2000 (taken from page IV-208) and the existing the age class distribution by forest type groups for the years 2000 and 2003 are displayed. The acres for 2003 are included to show the changes from 2000 through 2002. Numbers for the existing acres for 2000 and 2003 were obtained by querying the corporate database.

The Chippewa National Forest has implemented the Forest Plan through active management, working toward a desired age class distribution for each forest type group. The forest is close to meeting the 2000 planned age class distribution for the short rotation conifer, long rotation conifer, and aspen. Some differences in percentages can be explained in part by:

- Acquisitions or land exchanges where the timber types differ.
- Retyping during field inventory as a result of changing standards and forest succession resulting from mortality of old jack pine, balsam fir, and paper birch.
- Conversion from aspen and short rotation conifer to long rotation conifer, short rotation conifer to aspen, hardwoods to conifer or aspen, and aspen to upland opening.

The Chippewa Forest Plan, unlike some other forest plans in the Region, does not identify forest type group age class goals by management area. Consequently, when doing analysis for project areas, it is not possible to compare the existing timber type composition by management area and the age class within each type.

Table 2: Age class distribution planned and existing for 2000 and 2003.

Timber Type/Age Class	Planned (00)	%	Existing (00) all acres	%	Existing (03) all acres *	%
Short Rotation Conifer						
0-20	9,725	26	8,560	28	8,905	31
21-40	541	1	819	3	940	3
41-60	1,860	5	2,950	10	1,999	7
61-80	23,946	64	13,521	43	11,731	40
81+	1,338	4	4,950	16	5,488	19
	37,410		30,800		29,063	
Long Rotation Conifer						
0-20	7,805	10	13,765	15	10,794	12
21-40	16,023	20	31,755	36	31,913	34
41-60	40,816	52	6,609	7	8,974	10
61-80	553	1	12,271	13	12,008	13
81-100	223	0	13,968	15	13,765	15
101-120	13,110	17	9,186	10	10,721	12
121-140	0	0	2,303	3	2,853	3
141-160	77	0	178	0	485	<1
161-200+	0	0	1,314	1	1,010	1
	78,607		91,349		92,523	
Lowland Conifer						
0-20	6,298	11	2,624	3	2,169	3
21-40	719	1	1,742	2	2,216	3
41-60	175	0	3,590	5	3,090	4
61-80	18,494	31	10,957	14	9,487	12
81-100	333	1	19,922	26	19,450	26
101-120	32,875	55	24,111	32	24,739	32
121+	415	1	12,999	17	14,848	20
	59,309		75,945		75,999	
Hardwoods						
0-20	6,310	5	3,211	2	5,257	4
21-40	610	1	987	1	971	1
41-60	0	0	5,804	4	3,806	3
61-80	89,900	68	63,462	48	54,797	42
81-100	218	0	35,406	27	39,401	30
101-120	34,748	26	15,317	12	16,922	13
121+	404	0	8,243	6	9,272	7
	132,190		132,490		130,426	
Aspen						
0-10	51,701	22	45,413	20	32,042	14
11-20	55,828	24	47,273	22	59,519	27
21-30	39,101	17	40,050	18	38,855	17
31-40	30,294	12	18,226	8	25,433	11
41-50	780	0	6,899	4	8,532	4
51-60	0	0	9,399	4	7,057	3
61-70	41,644	18	29,137	10	18,468	8
71+	16,602	7	32,520	14	37,197	16
	235,950		228,917		227,103	

2. Results:

When looking more closely at **Table 2, Age Class Distribution, Planned and Existing, for 2000 – 2003**, the numbers suggest the following.

a. Short Rotation Conifer Type Group– consists of jack pine and balsam fir types.

Existing acreage of short rotation conifer in 2000 was 6,610 acres (18%) less than planned. The actual 0-20 age class for 2000 was 1165 acres less than planned, 28% of the type group compared to the planned 26%. In mixed pine stands typed as jack pine, red pine often succeeds the less tolerant and shorter-lived jack pine associate. Jack pine removed either through mortality or harvest left behind a red pine forest type. If stands were regenerated, sites were sometimes reforested with red pine. In either scenario, these acres would be reflected in increased acreage of long rotation conifer.

Within the last few years, the forest has harvested a significant portion (almost 50%) of jack pine type. Establishment of jack pine occurred in the wake of the logging shortly after the turn of the century and during the CCC era in the 1930s. Due to the rapid decline and mortality occurring within old stands of this forest type, there has been an emphasis on harvesting and reforesting these stands to maintain their productivity. Recently many of these sites are being successfully regenerated with jack pine using historical vegetative patterns as a guide.

Similarly, balsam fir types tend to be found in mixed species stands that often shifted to other types when the balsam fir died, or the stand was regenerated.

Due to natural mortality and harvesting of mature and over-mature short rotation conifer stands at a faster rate than anticipated by the Forest Plan, there were approximately 6813 acres (18% of planned 2000 acreage) less in the 61+ age class than planned at 2000.

b. Long Rotation Conifer Type Group – consists of red pine, white pine, and white spruce types.

According to the figures, the forest has exceeded both the total acreage planned for 2000, and the acreage in both the 0-20 and 21-40 year age classes. As explained previously, this in part is a function of shifts in forest type rather than entirely a function of regenerating the long rotation conifers. With regard to older age classes at 2000, approximately 13,187 acres were planned to be older than 101 years, compared to 12,981 actual acres.

Since 1986, extensive acres of immature stands of red pine planted by the CCC in the 1930s and early '40s have been commercially thinned, some for the second or third time. Most stands planted in the 1960s have been thinned once. There are also considerable acres of young red pine stands planted in the 1970s and 1980s that would benefit from thinning in the near future as they move into a merchantable size class.

c. Lowland Conifer Type Group – consists of black spruce, cedar, tamarack, and mixed swamp conifer types.

As of 2000, only 2,624 acres were in the 0-20 years age class, compared to a planned total of 6,298. Regeneration of lowland conifers since 1986 has proceeded at a rate less than planned for a number of reasons. Old aspen and balsam fir stands in adjacent uplands were considered higher priority for regeneration than long-lived lowland conifers when considering size of temporary openings. Lowland conifer stands examined for harvest often contained trees less than merchantable size or volume. Cedar types or mixed conifer types with more than 20% cedar were deferred from harvest due to uncertainty of obtaining cedar regeneration. In the last few years, concerns about obtaining adequate regeneration and questions on the timber suitability of these stands have been raised. Suitability was re-analyzed during

the Forest Plan revision. In addition, lowland conifer types often contain Regional Forester Sensitive plants.

Actual acreage of lowland conifer type group increased by 16,636 acres from 1986 to 2000. There has been no active management of lowland conifers to account for such a large increase. It appears that some acres formerly typed as non-forest lowland brush are now typed as lowland conifer.

d. Hardwood Type Group – consists of oaks, lowland hardwoods, northern hardwoods and paper birch types.

As of 2000, approximately 3,211 acres of hardwood type group were less than 20 years of age, compared to 6,310 acres planned. From 2000 – 2003, the amount of hardwood in the 0-20 year age class increased to 5,257 acres. Since 1986, higher regeneration priority has been on short rotation conifer and aspen types, due to limited demand and market for hardwood and the expectation that hardwoods would survive longer than adjacent, early successional, aspen, balsam fir, and jack pine stands when considering size of temporary openings. Hardwood types on the Chippewa, in contrast to most of the region, generally produce poor quality products and are most often used for pulpwood or firewood.

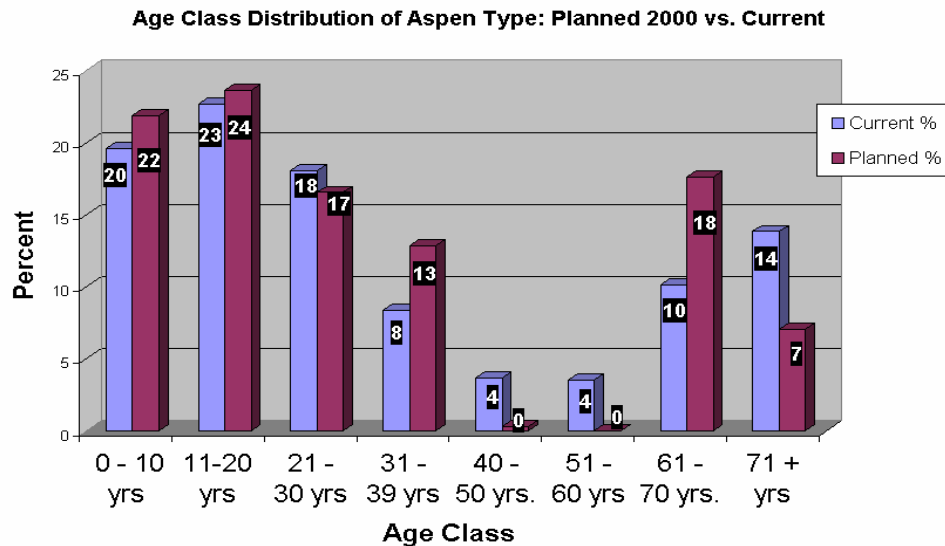
Type changes and loss of standing volume due to Dutch elm disease in the 1980s, drought and insect related mortality of oak and paper birch in the late 1980s, and continuing age related mortality of paper birch have not been assessed.

Hardwood stands provide important habitat for several TES species such as the goshawk, black-throated blue warbler, and older forest dependent species. Given the Forest Plan direction to maintain early successional forest types, and a pattern of intermingled private ownerships, these stands provide important habitat across the fragmented landscape for sensitive species. Management systems described in the Forest Plan focus are mainly even-aged systems, but given the disturbance ecology of many sites, and current wildlife issues, uneven-aged management may be more appropriate. This change is reflected in the Revised Forest Plan.

e. Aspen Type Group—consists of aspen and balsam poplar types.

Since 1986, there has been considerable emphasis on aspen harvest and management on the Forest. As indicated by the chart below, the 2000 age class distribution for the aspen type group is close to what the Forest Plan had projected.

- Within MAs 1.1, 1.2 and 1.3, emphasis has been on harvesting and regenerating aspen type group.
- Age class distribution the Plan prescribed for 2000 and what currently exists in 2003 are very close:
 - Regeneration of aspen during the last 30 years has resulted in existing age classes within 1-2 percentage points of the Plan projections. Since 1986, aspen has been clear cut 98% of the time, shelterwood cut 1%, and thinned 1% of the time.
 - The unbalanced age class distribution in aspen type group is evident in the small percentages of aspen in the 40-60 yrs classes.
 - Differences occur in the 61-70 and 71+ age classes, but when combined the forest currently has 24% of the aspen over 61 years while the plan projected 25%.



Existing species composition of mature (60+ yrs) aspen stands is variable and diverse.

- Stand typing was based on type and size class that dominates the site and will be managed to rotation age or until regenerated. Consequently, many mixed species stands are typed as aspen even though aspen may comprise 50% or less of the stand basal area. The composition of aspen stands varies across the forest. Given their existing composition, with time, natural succession would eventually convert most of these stands to balsam fir or more shade tolerant hardwood species such as red or sugar maple.

Harvest methods for aspen specified in the Forest Plan:

- "...the harvest methods to be used...apply to steady state stands in which the timber type to be regenerated is the same as that being harvested and in which the designated type constitutes a predominant percent of the trees in the stand." (IV-26)
- "...the matrix shows the timber types and the harvest methods appropriate for them. The circumstances that are listed encompass the vast majority of the stands to be harvested. It is recognized that there are a number of other possible circumstances (generally of a very specialized nature and requiring specialized methods)." (IV-26)
- Aspen – Clear cutting is the normal method with small clear-cuts also being used in retention and partial retention... (IV-27)
- Intermediate cutting in aspen, resulting in intensive management through the use of both commercial and precommercial thinning is specified. (IV-39).
- "An important objective in harvesting timber is to regenerate a stand to meet a number of resource management objectives. These include desired conditions for visual management, species composition, wildlife habitat, timber quality and integrated pest management. *Achieving the management objectives is foremost in selecting the harvest method* (emphasis added)." (Forest Plan, B-3)

3. Evaluation:

Emphasis in managing forest vegetation has been on harvesting and regenerating aspen, and short and long rotation conifer. Through timber harvesting, we are close to meeting the age class distribution in the aspen forest type group as planned for year 2000. Note however that there is an age class imbalance in the aspen in the 40-60 year old age classes and in the 60 year and older age classes for short rotation conifer.

Overall the acreage of short rotation conifer acres has decreased through conversion to aspen, hardwoods, and long rotation conifer, both by natural processes and active management.

Long rotation conifer type group has increased through conversion of aspen and short rotation conifer both by active management and natural processes.

B. TIMBER

1. Results:

In 2000 42.3 million board feet (MMBF) of timber were offered for sale, of which 4.0 MMBF did not sell during the first offering. In 2001 and 2002, 24.5 and 23.0 MMBF were offered and 1.3 and 8.3 respectively did not sell during the first offering. These “no bids sales” were later re-offered and subsequently sold.

During 2000 – 2002, 57.7, 39.2 and 32.8 MMBF, respectively of timber were harvested. Since 1986, the years 2001 and 2002 were the lowest timber harvest years.

The Forest Plan predicted a total of 114,364 acres to be sold with regeneration harvest over the period 1986 – 2002. The Chippewa actually sold 79,583 or 70% of the acres predicted. The Forest scheduled 21,880 acres to be sold with intermediate harvest prescriptions over the period 1986 – 2002 (17 years). The forest sold 26,876 acres or 123%. Combined overall accomplishment of acres sold for regeneration and intermediate harvests was 78% of planned.

The Forest Plan predicted that volume sold from conifer stands for the 1986 -2002 period would be 343.7 MMBF. Actual sold volume from conifer types through 2002 (17 years) was 286.5 MMBF or 83% of the predicted amount. The Forest Plan predicted that volume from hardwood types (including aspen) from 1986 – 2002 would be 1023.5 MMBF. Sold volume from these stands through 2002 was 718.5 MMBF or 70% of the predicted amount. Overall volume sold was 73.5% of the predicted amount.

Each National forest provides payments to the counties in which they are located. National Forest lands are not on the county tax roles so counties must provide services while receiving taxes from fewer parcels of land than if National Forest lands were in private ownership and therefore part of the tax base. Therefore National Forests make payments to counties in lieu of taxes and counties also receive a percentage of the receipts for sale of natural resources. During FY 2000, 2001 and 2002 total payments to the three counties (Beltrami, Cass and Itasca) were \$1,376,284, \$1,394,621 and \$1,356,626 respectively.

2. Evaluation:

With 2002 being the 17th year of management under the 1986 Forest Plan many additional issues were being considered compared to the early years of the Plan. In order to address these changed conditions and at the same time adhere to the standards and guidelines, varying approaches to analysis and management were used under the general guidance of the 1986 Forest Plan. This caused not only reduced accomplishment, but changes in the mix of harvest treatments as well. For example, for the years 2000 - 2002 intermediate harvest acres sold accounted for 60% of the total acreage harvested, compared with an intermediate harvest percentage of 13% for the years 1986-1991 and 29% for the years 1992-1999. In part, for the same reason regeneration harvest acres sold averaged 70% of predicted and intermediate harvest acres sold averaged 123% of predicted since 1986.

Another result of adjusting timber harvest treatments to meet NFMA requirements and other emerging issues has been a reduced amount of regeneration harvest in the last couple of years. The Forest Plan predicted that the 0-10 age class of aspen would represent approximately 22% of the aspen type in 2000. Data from 2000 shows 20% of the aspen type in the 0-10 age class. There has been a reduction in aspen acres sold, which began as a trend in 1994 and continued through 2002.

Current Forest Plan Revision efforts will yield new predicted harvest levels and are focused on new standards and guidelines that takes into account new issues.

The demand for Chippewa National Forest timber, especially pulpwood-sized material (both conifer and hardwoods) remained strong, though bid rates declined for most species product groups. For example, the average bid rate for red and white pine sawtimber decreased by approximately 30% for the period 2000-2002. During the same period the average bid rate for all pulpwood species decreased by approximately 13%.

Table 3: Sold, Harvest, Reforestation, and TSI Accomplishments. Volume in million cubic feet (MMCF)

Activity, Effect, Practice or Output	Forest Plan Output *	FY 1991 Actual	FY 1992 Actual	FY 1993 Actual	FY 1994 Actual	FY 1995 Actual	FY 1996 Actual	FY 1997 Actual	FY 1998 Actual	FY 1999 Actual	FY 2000 Actual	Forest Plan Output *	FY 2001 Actual	FY 2002 Actual
Timber Offered														
Total	12.3	12.9	11.7	10.8	9.5	9.1	10.0	9.4	9.9	8.8	6.7	15.5	3.9	3.6
Aspen	8.2	7.6	6.9	7.3	5.2	4.7	5.3	5.0	5.9	4.4	2.3	8.1	.7	1.7
Conifers	2.9	3.3	3.1	1.8	2.6	2.9	3.4	3.1	2.5	2.8	3.6	5.4	2.7	1.5
Hardwoods	1.2	2.0	1.7	1.7	1.7	1.5	1.3	1.3	1.5	1.6	.8	2.0	.5	.4
Timber Sold														
Total	12.3	12.9	11.7	10.8	9.5	8.5	8.8	8.2	9.6	7.5	6.1	15.5	3.7	2.3
Aspen	8.2	7.6	6.9	7.3	5.2	4.5	5.0	4.5	5.7	3.8	2.2	8.1	.7	.8
Conifers	2.9	3.3	3.1	1.8	2.6	2.6	3.0	3.0	2.6	2.5	3.2	5.4	2.4	1.2
Hardwoods	1.2	2.0	1.7	1.7	1.7	1.4	0.8	0.7	1.3	1.2	.7	2.0	.6	.3
Timber Cut														
Total	**	13.0	14.5	15.8	13.8	11.0	9.8	8.2	9.7	9.2	9.1	***	6.2	5.2
Aspen		9.2	9.9	10.6	8.3	6.3	6.0	4.4	5.1	4.9	4.9		3.2	2.0
Conifers		2.6	3.3	3.5	3.8	3.0	2.2	2.8	3.3	3.1	2.9		2.0	2.4
Hardwoods		1.2	1.3	1.7	1.7	1.7	1.6	1.0	1.3	1.2	1.3		1.0	.8
Regen. Harvest (acres)	6,756	6,354	5,525	5,272	5,391	4,215	4,338	3,344	3,811	3,080	1,670	6736	1,575	1,249
Intermed. Harvest (acres)	1,272	1,555	1,611	1,271	1,462	1,319	2,174	2,330	1,716	2,193	3,334	1400	2,657	835
Reforestation (acres)	6,508	7,888	7,069	7,276	7,558	6,323	4,618	3,787	4,692	3,773	3,022	6736	4,172	2,430
Timber Stand Imp (acres)	1,475	2,140	2,142	1,971	1,822	2,100	1,932	1,751	1,671	3,507	5,118	1645	4,352	2,889

* Annual average Forest Plan outputs projected for the period 1986-2000. ** No objective for timber volume or acres cut. ***Annual average FP output projected for the period 2001-2002.
MMCF= 1 million cubic feet. MMCF = 6.33 * million board feet.

Table 4: Sold, Harvest, Accomplishments. Volume in million board feet (MMBF)

Activity, Effect, Practice or Output	Forest Plan Output*	FY 1991 Actual	FY 1992 Actual	FY 1993 Actual	FY 1994 Actual	FY 1995 Actual	FY 1996 Actual	FY 1997 Actual	FY 1998 Actual	FY 1999 Actual	FY 2000 Actual	Forest Plan Output*	FY 2001 Actual	FY 2002 Actual
Timber Offered														
Total	77.9	81.4	73.7	68.1	60.0	57.8	63.4	59.2	61.7	55.5	42.3	98.1	24.5	23.0
Aspen	51.9	47.9	43.8	46.1	32.8	29.7	33.6	31.3	36.6	27.6	14.5	51.2	4.4	10.7
Conifers	18.4	20.9	19.4	11.3	16.3	18.2	21.5	19.5	15.9	17.5	22.6	34.2	16.7	9.5
Hardwoods	7.6	12.6	10.5	10.7	10.9	9.9	8.3	8.4	9.2	10.4	5.2	12.7	3.4	2.8
Timber Sold														
Total	77.9	81.4	73.7	68.1	60.0	54.1	55.9	52.0	60.0	47.2	38.3	98.1	23.2	14.7
Aspen	51.9	47.9	43.8	46.1	32.8	28.7	31.5	29.0	35.2	24.2	14.2	51.2	4.1	5.2
Conifers	18.4	20.9	19.4	11.3	16.3	16.4	19.0	18.7	16.5	15.6	19.9	34.2	15.4	7.5
Hardwoods	7.6	12.6	10.5	10.7	10.9	9.0	5.4	4.3	8.3	7.4	4.2	12.7	3.7	2.0
Timber Cut														
Total	**	82.4	91.6	100.0	87.3	69.3	62.3	52.1	60.4	58.0	57.7	**	39.2	32.8
Aspen		57.9	62.6	67.1	52.5	39.5	38.4	27.8	31.4	31.0	31.2		20.3	12.6
Conifers		16.6	20.9	22.1	24.1	19.1	14.1	17.6	20.8	19.6	18.3		12.9	15.2
Hardwoods		7.8	8.1	10.8	10.7	10.7	9.8	6.7	8.2	7.4	8.2		6.0	5.0

* Annual average allowable sale quantity.

** No objective for cut.

C. NATIONAL FOREST MANAGEMENT ACT (NFMA) REQUIREMENTS

Land suitability for timber production and maximum size limits for harvest areas were not monitored during 2000-2002. Those activities will be conducted as part of the forest plan revision process.

1. Restocking of Land

National Forest Management Act (NFMA) regulations require that cutover lands be adequately restocked within five years. Lands are certified as regenerated based upon the results of surveys one, three, or five years after artificial regeneration, or one or three years following natural regeneration activity.

a. Results:

Table 5. Acres reported as surveyed and certified by fiscal year.

	FY 2000	FY 2001	FY 2002
Stocking Surveys	6,076	6,772	3,574
Certification of Natural Regeneration	3,603	4,955	2,462
Certification of Artificial Regeneration	787	781	388
Total Acres Certified	4,390	5,736	2,850
Acres Surveyed but not Certified	1,686	1,036	724

b. Evaluation:

Certification would be expected to lag behind stocking surveys as stocking surveys for early years generally do not lead to certification. The acres of surveys and certification show a decline in FY2002. This follows a decline in harvesting for the related period leading to a reduction in regeneration needs.

2. Insect & Disease Control

a. Gypsy Moth:

In 2000, 362 Minnesota Department of Agriculture (MDA) traps and 8 U. S. Department of Agriculture (USDA) traps were set within the Chippewa National Forest boundary for a total of 370 Gypsy Moth traps.

In 2001, 82 traps (57 MDA & 25 USDA) were set on the Forest.

In 2002, 37 traps (3 MDA and 34 USDA) were set on the Forest.

No Gypsy moths were caught in any traps of the Chippewa National Forest during any of these years.

b. Forest Tent Caterpillar:

Levels of forest tent caterpillars were high during 2001 and 2002. The caterpillar causes defoliation of hardwoods, especially aspen and birch trees. Generally leaf replacement on trees and shrubs occurred in most locations.

D. WILDLIFE AND FISH

1. Habitat Improvement Accomplishments

Wildlife habitat improvement, including improvements for threatened and endangered species, consists of structural and non-structural habitat enhancement or restoration. Structural improvements include nesting islands, platforms, and boxes, and are expressed as the number of structures placed in suitable habitat that is currently lacking these particular features. Non-structural improvements include seeding, planting, deer habitat improvement, permanent opening construction, impoundment draw down, and prescribed burning, and are expressed as acres treated to enhance or restore current habitat conditions for a particular group of species. Lake and stream restoration and enhancements include structural and non-structural habitat improvements that address environmental features limiting the productive capability of lake and stream fish populations (spawning riffles, additions of large woody debris, riparian planting, restoration of aquatic vegetation, etc.). Table 6 displays annual accomplishments for wildlife and fish habitat restored or enhanced since 1986.

Table 6: Wildlife and Fish Habitat Improvements

Year	WILDLIFE		FISH	
	Non-Structural Improvements (Acres)	Structural Improvements (Structures)	Lake Improvements (Acres)	Stream Improvements (Miles)
1986-1991	9495	3203	486 ac; 1174 structures	not reported
1992	2245	462	2 ac; 26 structures	not reported
1993	2963	623	0 ac; 6 structures	not reported
1994	2404	181	2 ac; 100 structures	not reported
1995	942	582	129	3
1996	3716	671	95	2
1997	100	108	103	3
1998	190	0	13	5
1999	285	0	12	5
2000	1176	619	14	2
2001	2661	6	209	2
2002	1465	not reported	57	2

a. Results:

The 1986 Forest Plan for the Chippewa National Forest projected an annual accomplishment for the time period of 1991-2000 of 889 acres of non-structural wildlife habitat improvement. For the same time period, the Forest Plan also projected an annual accomplishment of 417 structural wildlife habitat improvements, as well as 69 fish habitat improvement structures. For the years 2000 through 2002, the Chippewa has generally met or exceeded the projected annual outputs for fish and wildlife habitat improvements. Beginning in 1995, the Forest's Management Attainment Report asked for fish habitat restored or enhanced to be expressed as acres and miles of improvement and not structures, and more recently, the wildlife program has stopped tracking structures. In response to this change in direction, an acreage figure for habitat restored or enhanced is now assigned to the placement of a habitat structure; for example, a loon nesting structure is now reported in acres of wildlife habitat enhanced.

2. Wildlife Population Monitoring - MIS

This category monitors and evaluates population trends of designated management indicator species to analyze the potential effects of management practices on wildlife habitats and populations.

Management indicator species (MIS) are defined as species monitored over time to assess the effects of

management activities on their populations and the populations of other species with similar habitat requirements (Forest Service Manual 2620.5). The rationale underlying the MIS concept is that by managing for and conserving the habitats in which MIS occur, other species that depend on these habitats would also be provided for. The Chippewa National Forest has identified fourteen MIS, each representing different wildlife or fish communities within the Forest. National Forest Management Act Regulations (CFR 36, part 219.19, paragraph a-6) state “Population trends of management indicator species will be monitored and relationships to habitat changes determined.”

MIS were designated in the Chippewa National Forest Land and Resource Management Plan (1986, page IV-65). Lowell H. Suring and John E. Mathisen (1983) selected the MIS for monitoring on the Chippewa National Forest. They included five categories for representation:

- (1) Endangered, threatened, or sensitive species;
- (2) Species with special habitat needs that may be influenced significantly by planned management programs;
- (3) Species commonly hunted, fished or trapped;
- (4) Non-game species of special interest
- (5) Species whose population changes are believed to indicate the effects of management activities on other species of selected major biological communities or on water quality.

Two species are listed as both threatened and MIS. One species is listed as sensitive and MIS. The great gray owl, originally designated a MIS in the Chippewa National Forest Land Management Plan, was replaced by the northern parula in Amendment #6 in 1989. Walleye was designated as a MIS by the Forest Plan, but was not discussed by Suring and Mathisen (1983). Table 7 lists the reason for selection for each Management Indicator Species. Since 1983, more has been learned about the preferred habitat for some of the species. In particular, the black-backed woodpecker and northern parula are now known to prefer habitats somewhat different than the habitats they were proposed to indicate. The preferred habitat for all species is also listed in Table 7.

Gray wolf and bald eagle were selected because of their status as federally threatened. Species federally listed since 1983 (piping plover and Canada lynx) have not been designated as MIS.

Monitoring of management indicator species is conducted by the Chippewa National Forest, the Minnesota Department of Natural Resources (MN DNR), and the Natural Resources Research Institute (NRRI). The NRRI data is available from Lind et al. (2002) and the NRRI web page. Many of the MIS birds are also regionally and nationally monitored by the National Breeding Bird Survey (BBS).

Table 7: Management Indicator Species on the Chippewa National Forest, with reasons selected (according to Suring and Mathisen, 1983) and the preferred habitat for each species.

Common name	Reason for selection	Preferred habitat
Gray wolf	Federally threatened	Broad spectrum of habitats with abundant ungulate prey
White-tailed deer	Represents shrub-sapling communities and is an important game species	Forests, swamps and open brushy areas
Bald eagle	Federally threatened	Large trees adjacent to fish bearing lakes and streams
American woodcock	Represents permanent opening community	Young aspen and hardwood stands, alder, and openings containing brush on moist soils
Barred owl	Represents lowland deciduous communities	Mature interior, hardwood and mixed deciduous-coniferous forests bordering lakes and wetlands
Black-backed woodpecker	Represents mixed upland communities and also is a Sensitive species.	Mature coniferous forests which include dead and dying tamarack / spruce bogs, white cedar infested with wood boring beetle larvae
Blackburnian warbler	Represents coniferous upland communities.	Mature lowland and upland coniferous forests, especially jack pine
Common loon	Represents aquatic communities	Clear lakes with undisturbed shorelines and islands for nesting
Northern parula	Represents lowland conifer communities	Mature interior, contiguous coniferous or mixed forests near water
Pileated woodpecker	Represents old growth deciduous upland communities and secondary cavity nesters	Mature, upland deciduous, mixed and coniferous forests which are dense canopied and contiguous
Pine warbler	Represents coniferous upland communities.	Mature white, red and jack pine forests, particularly white pine
Ring-necked duck	Represents wetland communities	Marshes, wooded ponds, bottomland lakes and open areas in swamps
Ruffed grouse	Represent deciduous upland communities and is an important game species	Early successional mixed and deciduous forests, particularly aspen and birch
Walleye	Represents aquatic communities and is an important game species	Large, clean and cold or moderately warm lakes and rivers

Table 8: Management Indicator Species Monitoring

Management Indicator Species	Unit of Measure	FY 88	FY 89	FY 90	FY 91	FY 92	FY 93	FY 94	FY 95	FY96	FY97	FY 98	FY 99	FY 00	FY 01	FY 02
American woodcock ¹	Singing males per route	4	3	5.1	5.4	5.7	4.0	2.8	4.2	N/S	2.6	3.8	3.9	5.7	5.1	3.6
Bald eagle ¹	Active breeding pairs	135	144	154	160	175	186	88	174	189	161	163	138	139	132	153
	Successful breeding pairs	91	98	101	99	101	108	119	97	97	104	ND	ND	93	107	87
	Young per active nest	1.08	1.13	1.03	1.00	0.80	0.92	0.99	0.93	0.76	.96	ND	ND	0.94	1.02	0.85
Barred owl ²	Owls per stop	0.21	0.40	0.50	0.40	0.30	0.40	0.30	0.50	N/S	0.26	N/S	0.36	N/S	0.48	N/S
Common loon ²	Active breeding pairs per lake	0.83	0.94	0.78	0.74	1.15	0.67	0.83	0.80	N/S	ND	N/S	<i>b</i>	N/A	N/A	N/A
	Adults/100 acres lake surface							3.6	3.6	3.8	3.5	3.4	3.2	N/S	3.4	N/S
	Average brood size at fledging	0.66	0.41	0.61	0.38	0.49	0.33	0.30	0.31	N/S	ND	N/S	0.43	N/S	0.48	N/S
Northern parula ³	No. of pairs			30182	<i>a</i> 6332	3048	4815	4500	ND	ND	3800	N/S	N/S	<i>c</i>	<i>c</i>	<i>c</i>
Pileated woodpecker ²	Calls per stop	0.32	0.46	0.42	0.37	0.24	0.22	0.41	0.32	N/S	0.63	N/S	.23	N/S	0.8	N/S
Ring-necked duck ²	Ducklings/acre of wetland	0.23	0.19	0.20	0.16	0.15	0.12	0.16	ND	N/S	ND	N/S	N/D	N/S	N/D	N/S
	Pairs per acre	0.08	0.06	0.07	0.05	0.05	0.04	0.05		N/S	ND	N/S	N/D	N/S	N/D	N/S
Ruffed grouse ¹	Drums/stops	1.6	2.2	1.6	1.5	0.8	0.6	0.7	0.7	N/S	2.0	1.4	1.3	1.1	0.7	0.8
Blackburnian warbler ³	No. of pairs	N/S	20,311	25,407	<i>a</i> 7,693	5,758	4,381	3,639	ND	ND	9,400	N/S	N/S	<i>c</i>	<i>c</i>	<i>c</i>
Pine warbler ³	No. of pairs	N/S	34,751	42,616	<i>a</i> 3,139	3,699	5,193	4,207	ND	ND	2,830	N/S	N/S	<i>c</i>	<i>c</i>	<i>c</i>
Gray wolf ²	No. of wolves	N/S	N/S		80 to 90	100	N/S	N/S	N/S	N/S	N/S	N/S	100 +	N/S	N/S	N/S
White-tailed deer ¹	Deer per sq.mi.	12.4	12.2	14.7	16.3	18.1	17.8	18.6	18.0	ND	11.0	10.2	11.9	15.6	15.2	15.8
Walleye ⁵	Pounds/acre	N/S	ND	ND	ND	ND	ND	ND	ND	ND	ND	<i>c</i>	<i>c</i>	N/S	N/S	N/S

a In 1991, the method used for monitoring changed, so were unable to compare with previous years.

b The 1999 Minnesota Loon Monitoring Program began displaying Loon Abundance in Adult Loons per 100 acres. Previous year data was converted in order to make comparisons.

c Population trends presented in graph form rather than breeding pairs or pounds/acre.

d N/S = Not Scheduled. ND = No Data. Monitoring Frequency: ¹Monitored Annually ²Monitored every 2 years ³Monitored every 3 years ⁵Monitored every 5 years

a. Results:

Population targets or base line populations were established in the Forest Plan for breeding bald eagles (150 pair), gray wolves (40-50 individuals), and white-tailed deer (25-30 per square mile).

3. Existing Forest-wide Wildlife Habitat Conditions:

The implementation of the 1986 Forest Plan has resulted in an existing forested landscape that has considerable implications to wildlife habitats and to wildlife populations native to the Chippewa National Forest (CNF). Because most timber harvesting has occurred on upland landforms, the effects to wildlife populations are especially evident in those species that are associated with upland forested habitats. For upland wildlife, the 1986 Forest Plan placed primary emphasis on providing habitat for large populations of game species (white-tailed deer, ruffed grouse, and American woodcock). These habitat conditions were to be provided through the regeneration of upland forest types, especially aspen and short rotation conifer type groups, by way of the clear cutting harvest method. These two forest type groups occupied approximately 53% of the upland area on the CNF in 2003, and approximately 39% of these two types were less than 20 years old in 2003 (see Table 2).

As discussed in the Vegetation Composition portion of this report, the implementation of the 1986 Forest Plan over the past 17 years has resulted in an abundance of habitats favorable to wildlife species associated with young, early successional upland forest conditions. Wildlife species, such as white-tailed deer, ruffed grouse, chestnut-sided warbler, and others associated with young forest habitat conditions have maintained relatively high population levels over the past 10-15 years of monitoring.

However, the amount, size, and spatial distribution of young, early successional forest within the CNF has also resulted in landscape conditions, which are not favorable to a wide variety of wildlife species. The harvest and regeneration of upland forest types over the past 15 years has caused:

- an increase in forest edge,
- an increase in habitat fragmentation,
- a decrease in mature and older forest conditions,
- a decrease in large mature forest patches, and
- a decrease in forest interior conditions.

Additionally, the emphasis on harvesting short rotation conifer and aspen has reduced the acreage of upland forest types in a vegetation growth stage capable of providing large amounts of snags and downed woody material at concentrated levels. The current age class imbalances in the short rotation conifer and aspen create bottlenecks in the habitat turnover rates needed to sustain habitat conditions and wildlife communities associated with these forest types over time. These current landscape conditions increase the concern for many wildlife species, which are associated with larger patches of mature and older upland forest habitats, such as the northern goshawk, red-shouldered hawk, black-throated blue warbler, black-backed woodpecker, Blackburnian warbler, and others.

a. American woodcock: Based upon the number of singing males per route over the time period from 2000-2002, American woodcock populations on the Chippewa National Forest appear to have rebounded from the levels estimated during the previous three years. When compared to the number of singing males per route in the Central Region of the American woodcock range in 2001 (Dexter, 2002), the 5.1 singing males per route on the Chippewa was more than double the number for the Central Region (approximately 1.9-2.0 singing males per route). Thus, woodcock population levels on the Chippewa appear to be higher than those found throughout the Central Region. The ten years of monitoring data collected on this species does not indicate a downward population trend on the Chippewa National Forest.

b. Bald eagle: Based upon the eagle breeding data collected during the past three years, Bald eagle populations appear to have remained relatively constant across the Chippewa National Forest. Although the number of active breeding pairs recorded over the past three years is some of the lowest numbers recorded during the past 10-15 years, the number of successful breeding pairs and the number of young per active nest are similar to those recorded since 1988. The number of active bald eagle breeding pairs appears to have leveled off on the Chippewa for the past five years. While the increasing competition among breeding pairs at higher nesting densities is thought to be the primary factor in breeding success declines, there may be a need for further analysis of this aspect of eagle population dynamics. This may result in a somewhat different monitoring strategy geared toward more focused population sampling in portions of the Forest with varying eagle nesting densities.

c. Barred owls: Based upon the number of barred owls recorded per stop along established survey routes in 2001 (0.48 owls per stop), owl population numbers in 2001 appear to be within the range of those recorded over the past 10-15 years. According to the data collected over that time period, barred owl numbers appear to fluctuate up and down from year to year without drastic variations. No definite trend in barred owl populations can be established at this time.

d. Common loon: The Minnesota Department of Natural Resources' Loon Monitoring Program breeding information for loons in three areas of northern Minnesota. In 2001, the adults/100 acres of lake surface and the average brood size at fledging, for Itasca County (near Marcell, MN), were not significantly different from that collected for that area in previous years.

e. Pileated woodpecker: Based upon the number of calls per stop, the pileated woodpecker numbers appear to continue to increase on the Chippewa National Forest. The calls per stop recorded in 2001 are the highest recorded during the past 10-15 years.

f. Ruffed grouse: Similar to the average number of drumming grouse per stop in the North census zone, the average number of male ruffed grouse drumming per stop on surveys conducted from 2000-2002 was lower than the average for the three previous years ('97-99') and appear to be approaching the cyclic low. The mean number of drumming grouse on the Chippewa in 2000-2002 (0.9 drums per stop) is slightly lower than the mean number across the North census zone during the same time period (1.3 drums per stop). The 0.7 and 0.8 drums per stop recorded on the Chippewa in 2001 and 2002, respectively, are similar to those of approximately 10 years ago, 0.8 in 1992 and 0.6 in 1993. The ruffed grouse population on the Chippewa National Forest appears to have remained relatively stable over the past 10-15 years, and continues to fluctuate in the cyclic manner characteristic of their population dynamics.

g. Forest Songbirds: The Natural Resources Research Institute, through the Breeding Bird Monitoring in Great Lakes National Forests project, has been monitoring breeding birds on the Chippewa National Forest since 1991. The Blackburnian warbler, northern parula, and pine warbler population levels on the Chippewa have been monitored through this project. The trends for these species are shown in Figures 1-3 below. None of these three warbler species show a statistically significant decrease in population trend. Although the northern parula and pine warbler show fairly stable population numbers over this monitoring period, the Blackburnian warbler shows a slight but relatively steady decline over this same time period.

Figure 1: Population Trend for Blackburnian Warbler on the Chippewa National Forest

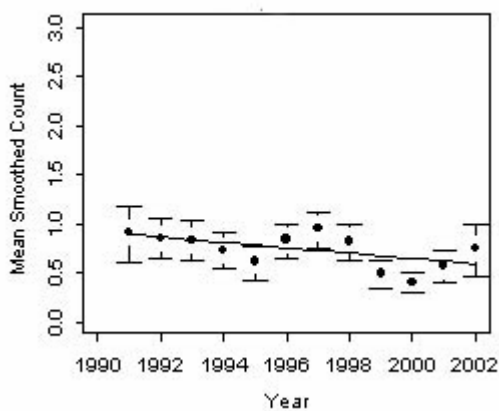


Figure 3: Population Trend for Pine Warbler on the Chippewa National Forest

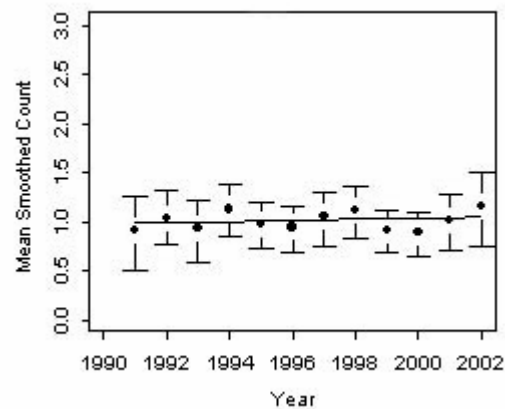
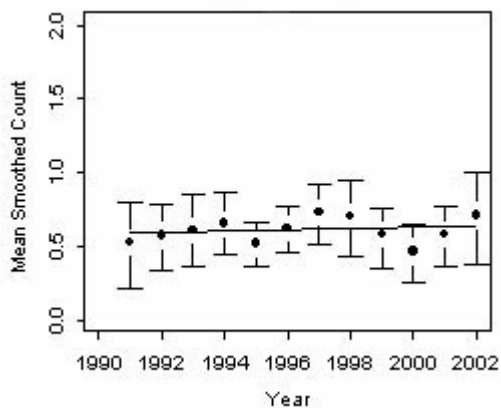


Figure 2: Population Trend for Northern Parula on the Chippewa National Forest



h. Gray wolf: In recent years, there has been a gradual, long-term increase in wolves in Minnesota. The Chippewa National Forest contributed observation information to the 1997-1998 wolf survey conducted for the state of Minnesota. This most recent assessment estimates 2,450 wolves ranging over 33,970 square miles of the state. This represents a 50% increase in wolf numbers and a 48% increase in contiguous pack range from the 1988-89 estimates. The area occupied by wolves within the contiguous pack range increased by 45% over that estimated in the 1988-89 survey. The calculated annual rate of wolf population increase from 1988-89 to 1997-98 was 1.045. This is nearly identical to the 1.04 calculated by Fuller et. al. for the period of 1970-1989.

The Minnesota Department of Natural Resources plans on conducting another formal statewide wolf survey during the winter of 2003-2004. As with similar surveys conducted in 1979, 1988, and 1998, this survey is expected to obtain data on wolf distribution and abundance in Minnesota. Results of this survey will be included in the next Chippewa National Forest Monitoring and Evaluation report

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E. GOBLIN FERN (*BOTRYCHIUM MORMO*)

Goblin fern, *Botrychium Mormo*, is a small species of moonwort found in rich hardwood forests in the northern portions of Minnesota. It is a Regional Forester Sensitive Species for Region 9.

The "Conservation Approach for Goblin fern, *Botrychium Mormo* W.H. Wagoner" was completed December 2001. It uses the best available information to suggest conservation measures to promote the persistence of this species on National Forest lands. Conservation measures are needed to reduce effects to *B. mormo* from land management activities, and help prevent the spread of exotic earthworms in *B. mormo* habitat. Measures need to be taken to attempt to ensure the future viability of *B. mormo*.

One of the information needs identified for the Goblin Fern was to investigate the response of this species to changes in overstory vegetation and winter logging as would occur in some typical forest management practices. One of the known colonies of goblin fern on the Forest was chosen. The site selected for this study is south of Lower Sucker Lake (Township 144 North, Range 30 West, Section 3), where goblin fern colonies occur on either side of Forest Road 2135. The colony on the west side of the road (14 acres) was chosen as a control and the east side (17 acres) was chosen for treatment of a typical hardwood management practice.

During 1995, both sites were extensively searched for goblin ferns and each plant location was marked. Plot data was taken in 1995 through 1999. Partial harvest over snow of the eastern site was planned to occur in early 2000 but was deferred due to lack of funds and other forest priorities. Currently,

treatment is scheduled for winter 2003-2004. Post treatment plot data will be collected for a number of years, depending on the extent of the response and confidence in the results.

F. RECREATION

1. Results:

The 1986 Chippewa National Forest Land Resource Management Plan identifies four recreation activities and outputs for annual monitoring and evaluation. They are:

- 1.) Hunter Walking Trails – Miles (annually)
- 2.) Trails:
 - a. Non-motorized Trails – Miles (annually)
 - b. Motorized Trails – Miles (annually)
- 3.) Boat Access:
 - a. Drive-In – Number (annually)
 - b. Carry-In – Number (annually)
- 4.) Recreation Use – RVDs (annually)

Between FY00 and FY02, the miles of hunter walking, and motorized trails have remained constant at 83 and 22 miles respectively. With completion of additional segments of Mi-Ge-Zi Trail, non-motorized trails increased by 14 miles to 212. There are currently 248 carry-in boat accesses, and 107 drive-in accesses on the forest. During the monitoring period, three back-in accesses were reconstructed. They include: Two at the Knutson Dam Access site (Cass Lake and Mississippi River), and one at Little Cut Foot Sioux Access.

Since the 1986 CNF LRMP was developed, the method for quantifying recreation use has changed dramatically. Historically, recreational use was counted in Recreational Visitor Days (RVDs). An RVD is defined as one person recreating for a 12-hour block of time. Currently the standard of measurement is a national forest visit (entry of one person for an unspecified period of time into the National Forest site or area for recreation activities).

Existing Forest Plans and other agency needs mandate visitor use monitoring. Thus, the National Visitation Use Monitoring Program (NVUM) was developed to provide statistically reliable estimates of visitor use to assist with federal land management planning decisions. The survey also provides important information for Congress and external customers including states, private industry, and academia.

In addition to estimating the numbers of visitors, the NVUM program obtained descriptive information about National Forest visitors. This information includes visitor age, race, activity participation, outdoor recreation expenditure profiles, and length of stay. Additionally, information about the visitor's satisfaction with Forest Service facilities and services was collected.

NVUM data also help to answer monitoring elements in the USDA Forest Service Strategic Plan (2000 Revision) and the international monitoring plan 2003 Nations Report on Sustainable Forest Management. Most elements have a fiscal year 2006 target for improvement. The NVUM study will be conducted again on the CNF in 2006.

Results of the NVUM on the Chippewa for FY 01 were 2.3 million recreation visits for 6.1 million RVDs. The top three recreation activities were snowmobiling, hunting, and fishing and visitor satisfaction met or exceeded expectations. A table summarizing visitor participation and primary activity on the CNF is included below. A further breakdown and activity analysis can be found in the National Visitor Use Monitoring Results (Kocis, et al., May 2002). NVUM will be conducted again in FY05.

Table 9. Chippewa National Forest Activity Participation and Primary Activity

Activity	Percent participation	Percent who said it was their primary activity
Camping in developed sites (family or group)	8.7	1.1
Primitive camping	0.5	0.0
Backpacking, camping in unroaded areas	0.8	0.3
Resorts, cabins and other accommodations on Forest Service managed lands (private or Forest Service run)	23.0	4.8
Picnicking and family day gatherings in developed sites (family or group)	12.2	1.8
Viewing wildlife, birds, fish, etc on national forest system lands	53.6	0.1
Viewing natural features such as scenery, flowers, etc on national forest system lands	45.1	5.4
Visiting historic and prehistoric sites/area	8.5	0.6
Visiting a nature center, nature trail or visitor information services	9.2	0.1
Nature Study	5.1	0.4
General/other- relaxing, hanging out, escaping noise and heat, etc,	74.3	7.0
Fishing- all types	33.4	24.4
Hunting- all types	20.7	19.0
Off-highway vehicle travel (4-wheelers, dirt bikes, etc)	8.4	0.3
Driving for pleasure on roads	27.8	1.5
Snowmobile travel	29.0	27.5
Motorized water travel (boats, ski sleds, etc)	20.9	0.1
Other motorized land/air activities (plane, other)	0.4	0.0
Hiking or walking	30.7	6.5
Horseback riding	1.1	0.7
Bicycling, including mountain bikes	3.6	1.3
Non-motorized water travel (canoe, raft, etc.)	4.9	0.5
Downhill skiing or snowboarding	0.1	0.1
Cross-country skiing, snow shoeing	21.7	0.8
Other non-motorized activities (swimming, games and sports)	10.6	0.8
Gathering mushrooms, berries, firewood, or other natural products	7.0	0.8

2. Evaluation:

Recreational use of the Chippewa National Forest continues to grow as private lands in north central Minnesota become increasingly more developed, the state population expands, and the northern lakes area becomes ever more popular as a year-around destination. Visitors seek out public land in which to pursue a diverse range of outdoor recreational activities. National trends indicate that winter, water-based, and developed land activities will in general grow faster than the population (Cordell's Projection of Outdoor Recreation Participation to 2050).

Currently, the Chippewa National Forest is providing an adequate range of hunter walking, and other non-motorized trail opportunities to meet current demand. With the completion of the Mi-Ge-Zi paved bike trail (phases 1-3), the forest has shifted its emphasis from construction to reconstruction of existing trails. Efforts will now be placed on improving the trail users experience, while protecting natural resource, mainly water quality/wetlands. The exception to this is the last phase of the Mi-Ge-Zi Trail (phase 4) that will connect the Norway Beach Recreation Area with the Great River Road National Scenic Byway. This phase will be implemented as funding opportunities and partners are secured.

Water access is one of the key recreation issues in the CNF forest plan revision. Inventories, assessments and collaboration with state and county recreation managers have occurred over the past two years. The final Forest Plan will describe goals, objectives, standards, and guidelines related to water access opportunities and management. The draft preferred alternative limits future construction of water access developments to five sites over the next decade, and permit maintenance of existing structures at current levels.

Motorized use continues to generate both Forest Service management and public concern. Again, this is one of the key recreation issues being addressed in the new forest plan. As identified in the draft preferred alternative, the forest is moving toward a closed unless posted open policy, with potential addition of 90 miles of new OHV, and 100 miles of snowmobile trail permitted over the planning period.

Peak use on the Chippewa occurs at fishing season opener, Minnesota Education Association (MEA) Convention weekend, opening of deer hunting season, summer holidays, and prime snowmobiling season.

Given the local and national trends in outdoor recreation the Chippewa National Forest is well positioned to help meet future recreation demands in trails, water access and general developed and dispersed use.

G. HERITAGE RESOURCES

1. Identification and Protection:

Compliance with various laws and regulations requires that the Chippewa National Forest identify and manage heritage resources (usually archeological and historic sites) which may potentially be eligible for the National Register of Historic Places. This must be accomplished prior to any activity that may damage or destroy the site. The Forest conducts reconnaissance field surveys to search for heritage resources in all proposed project areas that might involve earth disturbance. Projects which typically require surveys included timber sales, wildlife openings, utilities installations, gravel pit development and expansions, land exchanges, special use permit activities, proscribed burns, recreation facility development and maintenance.

A total of 8473 acres were surveyed in FY 2000 for proposed undertakings. 17,804 acres of no-effect reviews for projects, which were planned in areas which had already been surveyed in a previous year,

or which did not require survey for another reason (such as prior disturbance) were also documented. Thirty-six new heritage sites were recorded and 11 previously recorded sites were monitored. A special project to assess storm damage to 50 known sites located on Leech Lake and Lake Winnibigoshish was also completed. There were no adverse effects to historic properties.

A total of 8922 acres were surveyed in FY 2001 for proposed undertakings. 7958 acres of no-effect reviews for projects that were planned in areas which had already been surveyed in a previous year, or which did not require survey for another reason (such as prior disturbance) were also documented. Sixty-seven new heritage sites were recorded. There were no adverse effects to historic properties.

A total of 9292 acres were surveyed in FY 2002 for proposed undertakings. 10,445 acres of no-effect reviews for projects that were planned in areas which had already been surveyed in a previous year, or which did not require survey for another reason (such as prior disturbance) were also documented. Forty-five new heritage sites were recorded. There were no adverse effects to historic properties.

Working with Leech Lake Reservation, the Forest has initiated a program to identify and record traditional resource areas. The information gathered will be used in project planning, assessment, and implementation as it becomes available.

Heritage staff conducted numerous public interpretation and education activities. These included presentations to local schools, tourists, and community groups, as well as formal training sessions in partnership with other agencies. A crew of 36 volunteers contributed 968 hours to restoration of Rabideau CCC Camp Education Building during the Passport in Time Program FY 2000 and 2001.

2. Evaluation:

The following 7 archeological sites were found eligible to be listed on the National Register of Historic Places with concurrence of the State and Leech Lake Tribal Historic Preservation Offices: Third River Bridge, Kitchi Bay, South Pike Bay, Knutson Dam, Knutson Dam Blufftop, Williams Narrows, and Williams Narrows Campground. Evaluation of 15 Forest Service administrative structures was completed in FY 2002. One historic district was found eligible to be listed on the National Register of Historic Places with concurrence of the State Historic Preservation Office. Fifteen archeological sites were found to be ineligible for listing on the National Register of Historic Places.

Nomination of Rabideau CCC Camp as a National Historic Landmark will be completed in FY2003. Evaluation of Star Island recreation residence tracts and Cedar Springs Resort are scheduled for completion in FY 2003.

Surveys for the heritage program are driven by project work across the forest. Funding is not available to do surveys outside of project areas.

Overall, the Heritage Resource program is meeting the intent of the Forest Plan.

H. INTERPRETATION OF NATURAL AND HISTORIC AREAS

Natural and Historic Areas are management areas that are set up to preserve and interpret areas on the Forest which possess unique historic, biotic, aquatic, or geologic values.

Table 10: Comments on Natural or Historic Areas

Natural or Historic Area	Comments
Lost Forty	
Gilfillan Area	
Webster Lake Bog	
Rabideau CCC Camp	
Elmwood Island	
Pennington Bog	
Star Island Cultural Area	Culturally Sensitive. Proposed change addressed in FPR.
Winnie Campground Cultural Area	Culturally Sensitive. Proposed change addressed in FPR.
Ten Section Area	Includes Norway Beach Recreation Area and Visitor Information Center
Pignut Hickory Area	Not Evident. Proposed change addressed in FPR.
Cut Foot Sioux Ranger Station	Culturally Sensitive. Proposed change addressed in FPR.
Turtle Mound	
Williams Narrows	Biologically Sensitive. Proposed change addressed in FPR.
East Lake Pines	
Miller Lake	
Bear Island/Leech Lake	Culturally Sensitive. Proposed change addressed in FPR.
Inguadona Mounds	Culturally Sensitive. Proposed change addressed in FPR.

All of the unique areas on the Chippewa National Forest are monitored and/or interpreted to some degree, though it is difficult to monitor visitor use in some of the lesser-known sites. In the past, public affairs office has worked with the districts to put together numbers for visitation at these sites. In some cases, it is truly a guess or gut instinct that drives the numbers. The public affairs office in recent years has tried to put explanations on why numbers are up or down at a particular site. With the 2000-2002 monitoring report, we are working with facts pertinent to each site, and sometimes, without specific numbers.

1. Elmwood Island is located 3 miles south of Northome in Island Lake. A public water access is located on the northwest corner of the lake. There are 8 resorts on the lake and most of the shoreline is occupied by seasonal or year around residences. Improvements on the island include a trail, 2 campsites or lunch spots, and a wilderness latrine. Though not actually counted, use is fairly high in summer by boaters, campers, and people taking a break from fishing.

2. Forest Supervisor's Office is located in the city of Cass Lake, the Forest Supervisor's Office is visited most often by people obtaining various land use permits (fire, fuelwood, Christmas Trees) and by other agencies/community leaders coming in for meetings. In the summer, family groups do stop by for information and a few curious individuals come in to look at the historic building. We lead approximately 3-4 groups on tours inside (generally scouts) during the school year, and receive 1 group of Kindergartners each year from Cass Lake (approximately 150 students).

2. Gilfillan Area—This is primarily an upland site north of North Twin Lake and east of Bass Lake. The area is closed to use by motorized vehicles. Forest cover is mostly northern hardwood, aspen, planted red pine and white spruce. The area was formerly a private estate with an unusual number of forest and shrubland plants. Many plant species have declined due to increased shading from trees. Abundant lady slippers in parts of the upland are a featured attraction. The dispersed campsite and sand beach on site are occupied most of the summer.

3. Lost 40—The Lost 40 attracts both the casual Forest sight-seer as well as those who are specifically interested in old growth forest and forest management. In the past year, the St. Paul Research Station

created interpretive panels to discuss old growth forests which may have attracted more visitors with a connection to the Research lab, to the Lost Forty. An interpretive trail on National Forest and State lands describes the history and natural features of the site. The Blackduck and Deer River districts, both Visitor Centers and the Supervisor's Office receive many requests for information on Lost 40, including directions on how to get to the site. Groups from Blackduck and other schools visit annually. The Forest History Center refers visitors with an interest in old pine forests. The brochure for the self guided interpretive trail was reprinted in 2001. Trail use has not been counted recently, but overall the site remains perhaps the most heavily visited on the Forest.

4. Rabideau CCC camp—With the rehabilitation work completed on the Education building, and more interpretation being done both at the Blackduck district office as well as on site, visitation to Rabideau may also be increasing. During the past two summers, the Norway Beach naturalist schedule has included car caravans to the site. Most efforts are being put into bringing the public out to Rabideau and increasing their awareness of CCC history on the Forest. A Rabideau postcard was completed in 2002. Most inquiries are tied to the auto tour along the Scenic Highway--Beltrami County Highway 39/Cass County Highway 10.

5. Ten Section Area—Interpretation efforts focused on the 100 year Anniversary of the Minnesota Forest Reserve have brought renewed attention to the Ten Section area. Specific requests from visitors interested in old growth/mature pine forest are noted as increasing. Visitation numbers from the Norway Beach Visitor Center showed a slight decrease over the last 2 years (from approx. 8000 to 6400 visitors) though weather, construction within the Norway Beach Campground, and the economy have played a role. For the campgrounds, revenues have increased, but the actual camper numbers have remained stable.

6. Pennington Bog---In 2002, the DNR Non-Game offices in St. Paul and Bemidji issued 36 permits to the Pennington Bog. We receive only a few inquiries each year regarding the bog, though visitors could be accessing information on how to get to the bog via the internet.

7. Cut Foot Sioux Ranger Station---Building rehab and interpretation was completed in 2001. The Cut Foot Sioux Ranger Station leads tours to the site a few times each season so visitation is on the rise. There are approximately 10 people per tour---so 50 people per season participate in the guided walks. The turn off to the site is not marked, but Visitor Center staff direct visitors who are interested in seeing the site. There is also a display at the Visitor Center to introduce the history of the site.

8. Miller Lake---Very little interpretation for this area has occurred other than the Unique Area flyer. Some information is in the "Sharing our Secrets" brochure, but this does not seem to draw any great numbers.

9. Webster Lake Bog---Campers drawn to the seclusion of the Webster Lake campground are the most likely group to take the Bog walk. Information requests are most always attached to a desire for camping in quieter areas with hiking opportunities.

Proposed changes are being addressed in the Forest Plan Revision process. Additional sites are also being proposed.

I. ROADS

Table 11: Road Construction and Existing Miles

Activity, Effect, Practice or Output	Unit of Measure (Annual)	Forest Plan	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002
Construction	Miles	19.25	4.7	0.8	2.4	0.0	7.7	3.3	0.0	2.0	0.8
Collector	Miles	0.25	0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Local	Miles	19.0	4.7	0.8	2.4	0.0	7.7	3.2	0.0	2.0	0.8
Open - Local Roads	Miles	* 1,562.0	1,441.0	1,441.8	1,443.6	1,372.0	1,379.9	1,380	1,678	1,752	1,753
Closed - Local Roads	Miles	* 162.0	244.9	244.9	245.5	429.0	429.0	4290.0	333	323	324

* This value is the total that would exist in the year 2000.

1. Results

The 2.8 total miles of new construction were timber access related roads. No new collector roads were constructed.

2. Evaluation

Open Local road mileage was determined from Operational Maintenance Level (OML) 2 road information for the given years. OML 2 roads are local roads, managed as open to motor vehicles. Closed Local road mileage was determined from OML 1 road information for the given years. OML 1 roads are local roads, managed as closed to motor vehicles. These are the totals as reported in the Annual Roads Accomplishment Report.

Temporary Roads are roads that are authorized by contract, permit, lease or other written authorization, or emergency operation, not intended to be a part of the forest transportation system and not necessary for long-term resource management. Temporary road totals are not included in the above mileage totals.

A forest-wide Roads Analysis was completed in June 2002. The Roads Analysis report was developed to provide line officers with critical information to develop road systems that are safe and responsive to public needs and desires, are affordable and efficiently managed, have minimal negative ecological effects on the land, and are in balance with available funding for needed management actions. The Forest-wide report studied the passenger car suitable roads (OML 3, 4, and 5) and how these roads function with all traffic across the forest. Smaller (project or watershed) scale Roads Analysis reports tier off the Forest-wide report to study the local roads (OML 1 and 2). The reports are all issue driven, but are not considered decision-making documents. The reports document current conditions, and make recommendations for future improvements to the road system.

J. SOIL

1. Timber Sale Monitoring

Implementation of the Forest Plan has the potential to affect forest soils in a variety of ways. Several timber sales on National Forest lands were part of the Minnesota Forest Resources Council (MFRC) efforts to monitor the effectiveness of their Forest Management and Timber Harvesting Guidelines. The U.S Forest Service (Chippewa and Superior National Forests) is a member of the council. In 2000, seventeen sites were chosen on National Forest Service (NFS) lands, but all of the sites were on the Superior National Forest. In 2001, 12 sites were monitored on National Forest Service (NFS) lands. Seven of the sites were on the Superior National Forest and five sites were on the Chippewa National Forest. Sites were randomly selected half-townships across the forested areas of the state. The full results of the monitoring can be found in "Monitoring the Implementation of the Timber Harvesting and Forest management Guidelines on Public and Private Forest Land in Minnesota: Report 2001. A report by the Minnesota Department of Natural Resources, *DNR Document MP – 0902*, (*DNR Document MP – 0201* is for the year 2000). The data and information relevant to soils on NFS land are taken from the 2001 report and summarized below.

The two most significant timber harvest activities that can affect soil productivity are equipment traffic on forest soils and the removal of biomass from the site. The greatest potential for adverse impacts on forest soils from equipment operation is on the roads, landings and primary skid trails where repeated traffic occurs. Equipment traffic can compact soil, remove vegetation whose root systems hold the soil in place, and redirect surface water flow.

Table 12: Percent of timber harvest area occupied by forest roads and landings (12 sites on NFS lands).

	Monitoring Results	MFRC Guideline	Forest Plan Standard and Guideline
Roads & Landings	1.8% of the harvest area	Roads and landings portion of the site infrastructure should occupy no more than 3% of the harvest area.	Management activities will not compact the soil or damage tree roots to the extent that tree growth is reduced more than 5% on a project area

Retaining or redistributing slash (biomass) on the site is important as a major nutrient retention strategy. Slash also provides cover, food, and growing sites for plants and animals.

Table 13: Slash Management in timber harvest sites. (7¹ sites on NFS lands)

	Monitoring Results	MFRC Guideline	Forest Plan Standard and Guideline
Slash Disposal	Slash retained on site = 2 sites	Slash should be retained on site except where necessary to remove it to operate safely, to regenerate the stand or to minimize the potential for compaction on major skid trails.	Management activities will not cause a long-term reduction of soil nutrients. Unacceptable nutrient loss is nutrient removal over one rotation exceeding the natural rate of nutrient replacement.
	Slash redistributed = 3 sites		
	Slash piled on landing = 3 sites		

¹One site utilized two methods of slash disposal.

The actual information collected from each site is not available at this time.

In the year 2002, two sites were chosen for monitoring on NFS lands. There is one site on each Forest. The results from the data are being compiled.

a. Evaluation:

Roads and landings impacted less percentage of the harvest area than the maximum recommended by either MFRC guidelines or the Forest Plan. The Forest Plan does not have specific guidelines for slash management and nutrient loss was not measured. Slash was retained on the site 29% of the time.

2. Long-term Soil Productivity Study (LTSP)

As part of a national long-term soil productivity study, soil porosity and organic matter are being experimentally manipulated on large plots to determine the impacts of such manipulation on growth and species diversity of aspen stands on the Chippewa National Forest. Sampling five years after treatments occurred on the Ottawa National Forest in upper Michigan in 1996 and on the Huron-Manistee, in lower Michigan, in 1997. Research was done in two areas on the Chippewa National Forest. The first is on the Marcell Experimental Forest in the Marcell Moraine Land Type Association (LTA) and it was started in 1991. The second study area is on the Pike Bay Experimental Forest in the Guthrie Till Plain LTA and began in 1993.

a. Results:

Preliminary findings on test plots indicate that disturbance treatments decreased 5-year growth of potential crop trees and delayed early stand development. Four test plots were prepared to determine the effects of soil compaction and organic matter removal on soil properties and growth of aspen suckers; associated species and herbaceous vegetation on stand development. The study involved winter harvest of 70-year-old aspen growing on loamy sand with a site index of 65.

The following treatments were applied to the sites:

- 1) whole tree harvest (trees lifted off the site with little or no ground disturbance from machinery)
- 2) soil compaction
- 3) forest floor removal and
- 4) soil compaction and forest floor removal.

After five growing seasons, numbers of suckers was extremely limited on the soil compaction areas. Mean diameter and height of regeneration was greatest on the whole tree harvest area. The treatment areas of soil compaction, forest floor removal or both all resulted in reduced biomass of foliage, stems, and total suckers to about one half of that produced on the whole tree harvest treatment. And, after five years, there was an abundance of saplings (>1 inch dbh) on the whole tree harvest area but few on the other treatment areas.

Data collection (soil bulk density, soil strength, plant nutrient analysis and regeneration by species) continued in years seven and ten, but it has not been compiled.

b. Evaluation:

The data suggests that managers should plan activities to minimize the area covered by machine traffic and to avoid traffic in the spring after suckers have begun to emerge. Data collected still needs to be summarized and conclusions and recommendation made by the research group.

3. Big Bud Timber Harvest Monitoring Project

In addition to the LTSP study, the Big Bud timber sale in the Pike Bay Experimental Forest on the Guthrie Till Plain was selected to further study the effects of timber harvesting on soil productivity. The study is conducted by the North Central Research Station in Grand Rapids. Soil strength, soil bulk density, site disturbance and the regeneration of vegetation was sampled in 1998 and 1999. Data collections were planned for 2003 but did not occur.

4. Exotic Earthworms

For the past several years, the Chippewa National Forest has been monitoring the effects of exotic earthworm (European in origin) invasion on the soil resource. Drastic changes in the distribution of soil organic matter (litter and humus layers) caused by the invasion of earthworms has been documented along with shifts in the animal and plant community species composition. Cindy Hale, a PhD student from the University of Minnesota, has been responsible for much of the research on earthworm impacts. Three sites on Ottertail Point (Leech Lake) and one site on Blackduck Point (Leech Lake) are being studied.

Deer exclosures were built on Ottertail Point to study the combined effect of deer and earthworm impacts. The deer exclosure study is being conducted by another graduate student from the University of Minnesota and is still ongoing.

a. Results:

The last year for fieldwork was 2001. During that time there were fall and spring vegetation surveys conducted and the upper soil horizons were examined. Earthworms were surveyed in the fall. A number of papers in connection to the research area are expected to be completed during 2003-2004.

b. Evaluation:

Public awareness about exotic earthworms has grown exponentially compared to when the study began. Just in the past year there has been news coverage on National Public Radio and in the Wall Street Journal about the effect of exotic earthworms on the forest ecosystem. Resorts and fishermen are becoming aware of the issue and hopefully the Forest will see a reduction of worms being released into the forest environment.

There are still many unanswered questions about the effect of the worms, the extent of ecological damage and the extent of the populations and species composition. How the earthworms affect tree productivity is another unknown. Funding sources and partnerships are being sought by the North Central Experiment Station for studying the effect of the earthworm invasion on tree growth.

5. Ecological Classification and Inventory Project (Terrestrial EC&I)

Initiated in 1992, the Chippewa National Forest Demonstration Project is a cooperative project between the Chippewa National Forest and the Minnesota Department of Natural Resources. The purpose of the project is to demonstrate the methodology used in Ecological Classification and Inventory and to show how ecological land units may be used to address land management issues.

a. Results:

Landtype associations, landtypes, and landtype phases are three ecological units being delineated and inventoried. Map unit identification and field data collection occurred until June 2001 then lapsed as a result of personnel changes. The Bemidji Sand Plain was partially completed.

b. Evaluation:

Plans are to fund and resume the phase level inventory until it is completed.

K. WATER - LAKES AND STREAMS

1. Lakes

a. Sampling Strategy

The Forest maintains a representative set of 10 lakes that are sampled at regular intervals to determine if there is a change in water quality over time. The Forest Plan states that a significant reduction in water quality occurs when the Carlson Trophic State Index (TSI) increases by more than 15 percent from pre-1980 index values (LRMP p. IV-44). The Carlson Trophic State Index is a measure of the productivity of a lake. An increase in trophic state index represents a decrease in water quality. Trophic states of lakes are usually broken into four broad categories:

- **Oligotrophic:** TSI scores between 20 and 40. Low productivity lakes that have high transparencies (clear lakes), are often cold and deep, fishery is limited because of low productivity of plant community.
- **Mesotrophic:** TSI scores between 40 and 50. Moderately productive lakes, common in Minnesota, often support quality fishery.
- **Eutrophic:** TSI scores between 51 and 70. Highly productive lakes, experience frequent nuisance algal blooms, transparency is low, supports fishery.
- **Hypereutrophic:** TSI greater than 70. Extremely productive lakes, often clogged with vegetation, supports rough fish if any, highly subject to winter kill due to low oxygen levels, rare in Minnesota.

Beaver, Adele, Caribou, Mabel, Webster, Lake Thirteen and Little Cutfoot Sioux Lakes have been monitored since the mid-1970s. In 1989, Big Rice, Round, and Lower Sucker Lakes were added to the monitoring program. Lakes are sampled three times during the open water season on an alternating schedule so that each lake is actively monitored every two to three years. Water quality in the trend lakes was not sampled 2000 or 2001. Caribou, Adele, Beaver, Little Cutfoot Sioux and Lake 13 were sampled in 2002.

b. Evaluation:

Table 14: Trophic State of Trend Lakes

Lake Name	Pre- 1980 Score	TSI Score 2002	Trophic State	% Change in Condition
Lake 13	47.7	38.4	Oligotrophic	+19.4
Little Cutfoot	59.9	54.6	Eutrophic	+9
Sioux				
Beaver	39.2	42.2	Mesotrophic	-6
Adele	45	42.3	Mesotrophic	+6
Caribou	36.8	27.2	Oligotrophic	+26

All of these lakes are distributing normal year-to-year variability for water quality. Caribou has demonstrated a trend towards increasing water quality, particularly for nutrients such as total phosphorus.

2. Streams

a. Water quality

Compliance with NFMA and the Forest Plan standards for stream water quality require long-term monitoring of a sub-sample of Forest streams. Six streams are currently enrolled in the long-term trend monitoring program. Simpson Creek, Fletcher Creek, and the Rice River have been monitored since the mid- 1970s. In 1990, The Mississippi, Big Fork, and Turtle Rivers were added to the monitoring program.

Water quality data is used to determine a stream water quality index value for each stream. The index represents an arbitrary scale based on weighted parameters. Values range from 0 to 100, with an index score of 100 representing the highest water quality streams for fisheries and recreational uses. A score of 0 represents very poor water quality for these same resources. The water quality index scores are useful for comparing water quality between streams and in the same stream over time (trends).

Monitoring consists of collecting water quality samples and flow data three times per site during the open water season. Streams are monitored on a rotating basis so not all streams are sampled each year. Rice River, Simpson Creek and Fletcher Creek were sampled in 2002.

b. Evaluation:

Table 15: Water Quality Index Scores of Trend Streams

Stream	Base Value (Based on historic water quality)	Avg. index score of all years monitored	2002 index scores	Number of years monitored
Rice	74	75.7	74.3	16
Simpson	71	71.3	74.2	13
Fletcher	64	72.0	75.1	10

All streams monitored are at or near the 75th percentile of the water quality index and do not show a trend toward declining water quality. Fletcher Creek rates higher on the water quality index than base levels, however sample size for this stream was low prior to 1986.

3. Water Quantity

Water quantity is measured continuously during the open water season on the Mississippi River and the Turtle and North Turtle Rivers. Discharge from these streams constitutes the vast percentage of the hydrologic budget, or total water input for the Cass Lake watershed. Average daily flows and precipitation data are used to develop computer model simulations of lake response based on a variety of management scenarios for the Knutson Dam.

4. Pesticides - Groundwater

Broadcast application of pesticides has not been used on the Forest since 1990. The only pesticide use currently approved on the Forest is selective application of glyphosate (Round Up) on poison ivy in developed recreation sites and along trails. No pesticide monitoring occurred in 2002.

5. Designated Water Uses

Twelve designated swimming areas were sampled in 2002. Fecal coliform levels were in compliance with the standard at all sites. No swimming areas were posted or closed.

6. Drinking Water Supplies

Monitoring of drinking water supplies consists of collecting and analyzing well water samples from all designated drinking water sources operated by the National Forest. Monitoring plans for individual

wells, calls for monitoring on an annual, or monthly basis depending on requirements in Forty-nine wells were tested for bacteria and nitrates in 2002. Corrective action is taken on wells not meeting state guidelines for bacterial contamination. Wells are closed, corrective action is taken and do not re-open until sampling shows that they are in compliance with regulations. For a current list of Chippewa drinking water supplies and compliance with safe drinking water standards visit:

www.epa.gov/enviro/html/sdwis/sdwis_query.html , then click on the Minnesota map and scroll down to Water System ID and type in MN and the PWSID# from the table below (MN5110546).

The Minnesota Department of Health also requires that sanitary surveys be conducted on all water systems. In 2002, 90% of the sanitary surveys were not completed. The Department of Health also requires that we have an Operation and Maintenance Plan for our water supplies. Operation and Maintenance Plans have been developed for supplies that have hand pumps. O&M Plans for three pressure systems (Norway Beach Complex, Onegume and Stony Point) or for the solar pump at Horse Camp have not been developed yet. All wells in 2002 were below the Forest and State drinking water standard of 10mg/L Nitrate nitrogen.

Table 16: Wells monitored.

Classification	Well Name/PSWID Number/Dist ID#
Noncommunity- Transient	South Pike Bay West/5110523/C-W3
Noncommunity- Transient	South Pike Bay East/5110523/C-W2
Noncommunity- Transient	Wanaki Campground/5110519/c-W9
Noncommunity- Transient	Norway Beach Campground/5110702/C-W26 well#2 - new well unique # 653985
Noncommunity- Transient	Cass Lake Campground/5110701/C-W12
Noncommunity- Transient	Cass Lake CG Handpump/5110701/C-w25
Noncommunity- Transient	Chippewa CG Handpump/5111080/C-w23
Noncommunity- Transient	Chippewa Campground/5111080/C-w22
Noncommunity- Transient	Mosomo Point Camp/5310387/D-W7
Noncommunity- Transient	Cutfoot Sioux VIC/5310600/D-AW2
Noncommunity- Transient	Williams Narrows North/5310453/D-W18
Noncommunity- Transient	Williams Narrows South/5310453/D-W10
Noncommunity- Transient	O-NE-GUM-E Camp/5310389/D-W8
Noncommunity- Transient	Plughat Camp/5310390/D-W12
Noncommunity- Transient	Tamarack Point Camp/5110525/D-W13
Noncommunity- Transient	Deer Lake South/5310383/D-W2
Noncommunity- Transient	Deer Lake North/5310383/D-W3
Noncommunity- Transient	West Seelye Camp/5310392/D-W4
Noncommunity- Transient	East Seelye Pt./5310385/d-w20
Noncommunity- Transient	West Winnie Campground/5110703/c-w7
Noncommunity- Transient	Stony Point Campground/5110524/w-w5
Noncommunity- Transient	Benjamin picnic/5040266/b-w1
Noncommunity- Transient	Noma Lake Campground/5310835/b-w2
Noncommunity- Transient	Clubhouse North Campground/5310381/m-w1
Noncommunity- Transient	Clubhouse South Campground/5310381/m-w13 -new well-Unique#661156
Noncommunity- Transient	Marcell Ranger Station/5310605/m-w8
Noncommunity- Transient	Northstar Campground North/5310388/m-w10
Noncommunity- Transient	Northstar Campground South/5310388/m-w11
Noncommunity- Transient	Mabel lake campground/5110546/w-w3
Noncommunity- Transient	Mabel lake Picnic/5110546/w-w4

Noncommunity- Nontransient	Walker Ranger Station/564968/w-w1
Nonpublic	Nushka Group Camp/5040724/c-w21
Nonpublic	Knutson Dam/5040267/C-W8
Nonpublic	Birches Picnic/5310840/D-W14
Nonpublic	Cutfoot Warehouse/5310601/D-AW4
Nonpublic	Cut foot Residence/5310382/D-AW3
Nonpublic	Cut Foot Horse Camp/5310847/d-w19
Nonpublic	Lake Erin Wayside/511079/w-w8
Nonpublic	Central shop/5111077/c-w17
Nonpublic	Webster Lake Campground/5040281/b-w6
Nonpublic	Webster Lake Picnic/5040281/b-w7
Nonpublic	Rabideau CCC Camp/5040723/b-w9
Nonpublic	Shogren Dam/5310835/b-w4
Nonpublic	Marcell Residence/5310837/m-w9
Nonpublic	Marcell Benahouse/5310838/m-w12
Nonpublic	Woodtick Trailhead/5111078/w-w7
Nonpublic	Watershed Lab/5111081/c-w18
Nonpublic	Marcell Field Lab//5310839/NC-w1 *
Nonpublic	Marcell Research Center/MRC-w1/unique#688215

L. LANDS

1. Results:

During 2000, 2001 and 2002 the Chippewa National Forest acquired three tracts totaling 196.62 acres of land using funds appropriated from the Land and Water Conservation Fund. The tracts include approximately 9,000 feet of frontage on Leech Lake, Trout and Little Trout Lakes, and Copenhagen Lake.

2. Evaluation:

At the start of 2003 the National Forest land ownership within the Chippewa National Forest was 666,522 acres, which is 50.7 percent of the land area within the boundaries of the Forest (does not include 285,300 acres of meandered water bodies within the Forest). At the start of 1986, when the current Forest Plan was approved, the National Forest land ownership was 661,441 acres, or 50.3 percent of the land area within the Forest boundaries.

The net acreage gain since the start of 1986, the first year of the current Forest Plan, is 5,081 acres, for an average of 299 acres per year. The average acreage gain over the past five years is 51 acres per year, which reflects both decreased funding along with an emphasis on acquiring key lakeshore tracts that have risen dramatically in market value. The outlook is for limited funding that's focused on a select few high priority tracts.

Land exchanges continue to become more complex, costly and closely scrutinized at the Regional and National levels. Funding in 2000 to 2002 has been inadequate to complete any exchanges. The best opportunities for cost-effective exchanges are with Cass, Itasca and Beltrami Counties, for purposes of consolidating mixed ownerships. Several thousand acres are potentially available for logical exchanges with the counties.

V. List of Preparers

The following people collected, evaluated, or compiled data for the fiscal years 2000, 2001, and 2002 Monitoring and Evaluation Report:

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